Comparison of Trabectome Ab Interno Trabeculectomy to Baerveldt and Ahmed Glaucoma Implants

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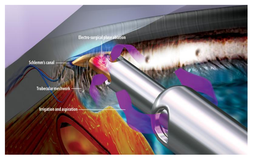
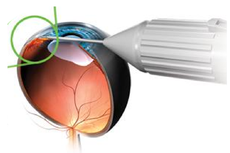
Purpose

- To compare reduction of intraocular pressure (IOP) and number of medications after trabecular meshwork ablation with the **Trabectome (T)** to **Ahmed (AGI)** or **Baerveldt (BGI)** aqueous shunts which bypass the conventional drainage system.
- Surprisingly, IOP outcomes for **T**, a minimally invasive glaucoma surgery, versus trabeculectomy have shown similar IOP results [i] but the success rates were lower.[ii]
- **T** rarely causes serious complications and has about 10 times less non-serious complications compared to trabeculectomy or aqueous shunts.[iii]
- Because of the above, we are now using **T** also in moderate to very advanced glaucoma for initial surgeries.
- **T** has not been compared to **AGI** or **BGI**.

Methods

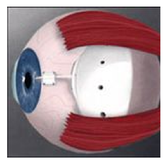
Trabectome





- 1 year IOP ~ 15 mmHg
- fast, safe
- no permanent hardware
- needs clear cornea
- significant learning curve

Baerveldt



- 1 year IOP ~ 14 mmHg
- nonvalved = less obstruction
- works well in uveitis
- tube can erode

Ahmed

- 1 year IOP ~ 17 mmHg
- valved = fast IOP lowering
- works well in uveitis
- valve can obstruct
- tube can erode

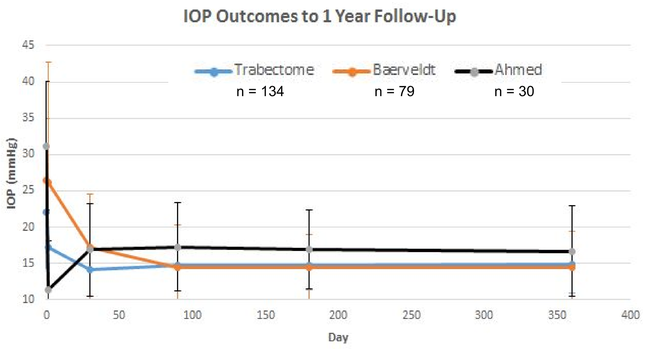
- Retrospective study of outcomes of **T** (n=125), **BGI** (n=131) and **AGI** (n=44) up to 1 year.
- Procedures were performed by the same group of surgeons on comparable patient populations for primary and secondary open angle glaucomas and chronic angle closure.
- Exclusion criteria consisted of neovascular glaucoma.
- IOP and number of medications were compared with a non-paired Student's t-test and considered significant if $p<0.05$.

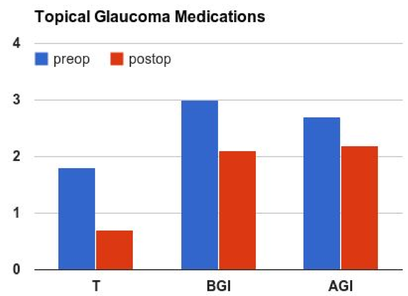
Results

All Eyes

- **T** had a preoperative IOP of 22.0±7.7 mmHg that decreased to 14.7±3.4 mmHg at 6 months and 14.9±3.9 mmHg at 12 months (32% decrease). The number of medications dropped from 1.8 to 0.7.
- **BGI** had a preoperative IOP of 22.8±7.8 mmHg that decreased to 14.1±12.5 mmHg at 6 months and 14.5±12.5 mmHg at 12 months (45% decrease). The number of medications dropped from 3.0 to 2.1.
- **AGI** had a preoperative IOP of 31.2±8.9 mmHg that decreased to 17.2±5.1 mmHg at 6 months and 16.7± 6.2 mmHg at 12 months (46% decrease). The number of medications dropped from 2.7 to 2.2.
- IOPs at 6 and 12 months were not significantly different between **T** and **BGI** ($p>0.05$) or **T** and **AGI** ($p>0.05$).
- Drops were reduced in **T** by 0.9, in **BGI** by 0.9 and in **AGI** by 0.5.
- In **T**, transient cystoid macular edema (CME) occurred in 0.8% and 4.8% required further surgery. In **BGI**, there was hypotony in 6%, wound leaks in 4%, and cystoid macular edema in 4% while 5% required further surgery. In **AGI**, there were choroidal effusions in 7% and 7% required further surgery.

Eyes with 1 Year Follow Up Only





Discussion

- **T**, **BGI** and **AGI** had similar final IOPs and reduction of glaucoma medications at 6 and 12 months.
- Reoperation rate for IOP control was similar in all 3 groups.
- In contrast to **BGI** and **AGI**, patients who underwent **T** had no serious complications.
- Percent reduction of IOP was highest in **AGI** due to a higher preoperative IOP. Baseline and postoperative IOP of **T** and **BGI** were very similar while both were higher in **AGI** possibly reflecting the use of valved AGIs to lower IOP acutely.
- Reduction of medications was the same in **T** and **BGI** but less in **AGI.**
- Use of one more medication at baseline in **AGI** and **BGI** suggest that IOP might have been more difficult to control in these groups. Data will benefit from stratification or matching by glaucoma stage and medications.

Conclusion

- **T** and **BGI** were similar although the mechanism of IOP reduction in **T** requires a patent natural drainage system while **BGI** bypasses it.
- Results of this study will allow informed design of RCTs or matching strategies and justify crossover in case of failure.

Disclosures

Sushma Kola (suk55@pitt.edu), Evan Lagouros, Kevin Kaplowitz, Rachel Davis, Joel Schuman: None.
Nils Loewen (loewen.nils@gmail.com): Trabectome Trainer.

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